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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SAN FRANCISCO DIVISION

GOOGLE LLC,

Plaintiff and Counter-defendant,

v.

SONOS, INC.,

Defendant and Counter-claimant.

Case No. 3:20-cv-06754-WHA
Related to Case No. 3:21-cv-07559-WHA

DECLARATION OF DOUGLAS C. SCHMIDT IN SUPPORT OF SONOS'S MOTION FOR SUMMARY JUDGMENT REGARDING GOOGLE'S CONTRACT-RELATED CLAIMS

Date: April 13, 2023
Time: 8:00 A.M.
Place: Courtroom 12, 19th Floor
Judge: Hon. William Alsup

Complaint Filed: September 28, 2020

I, Douglas C. Schmidt, declare as follows and would so testify under oath if called upon to do so:

1. I make this declaration based on my personal knowledge, unless otherwise noted. If called, I can and will testify competently to the matters set forth herein.

2. I make this declaration in support of Sonos's Motion for Summary Judgment.

3. I am the Cornelius Vanderbilt Professor of Engineering in the Department of Electrical Engineering and Computer Science at Vanderbilt University in Nashville, TN, where I also served as the Associate Provost for Research Development and Technologies and the co-Director of the Data Science Institute. My research spans a broad range of software systems, including distributed object computing, middleware platforms, real-time operating systems, and distributed real-time and embedded systems. I became a Full Professor with tenure at Vanderbilt University in January 2003.

4. I received my Doctor of Philosophy (Ph.D.) degree in Computer Science from the University of California (UC) Irvine in Irvine, CA in 1994. I also earned a Master's Degree in Computer Science from UC Irvine in 1990, as well as a Bachelor's Degree in Sociology in 1984 and Master's Degree in Sociology in 1986 from the College of William and Mary in Williamsburg, VA. I first started programming in 1983 when I was an undergraduate student taking statistics courses. From 1985 through 1994 I learned how to program in Pascal, C, C++, Ada, Prolog, and Lisp, both at the College of William and Mary and at UC Irvine.

5. I have been a full-time university professor since 1994. I was previously a tenured professor at the University of California, Irvine in the Electrical and Computer Engineering department, from 2000 to 2003, and before that at Washington University in St. Louis, MO in the Computer Science and Engineering department and the Mallinckrodt Institute of Radiology, from 1994 to 1999. In addition, I served as the Chief Technology Officer and Deputy Director for the Software Engineering Institute (SEI) at Carnegie Mellon University from 2010 to 2012, where I led the SEI's research, development, and operational efforts related to software engineering and cyber-security.

6. For the past three decades, my research has focused on distributed real-time and embedded (DRE) systems, which has yielded the ACE, Java ACE, TAO, and CIAO middleware frameworks. The millions of lines of object-oriented code in these frameworks provide layers of infrastructure and distribution middleware that simplify the development of concurrent and networked software apps and services. These middleware frameworks constitute some of the most successful examples of software research and development (R&D) ever transitioned from research to industry, being widely used by thousands of companies and agencies worldwide in many domains, including national defense and homeland security, datacom/telecom, financial services, healthcare, and online gaming.

7. My research on DRE systems has been funded by various organizations, including both federal agencies, such as DARPA, NSF, NASA, NIH, the U.S. Air Force, and the U.S. Navy, as well as leading companies, such as Northrup Grumman, Raytheon, Lockheed-Martin, Boeing, McDonnell-Douglas, General Electric, Siemens Medical Engineering, and Kodak Health Imaging Systems. I have also received other honors and awards, including election to professional organizations, engagements for invited talks, and the 2015 Award for Excellence in Teaching from the Vanderbilt University Department of Electrical Engineering.

8. Besides my academic and research experience, from 2010 to 2014, I served as a member of the United States Air Force Scientific Advisory Board (SAB), where I was the Vice Chair of the SAB's Cyber Situational Awareness study, which conducted a comprehensive review of the U.S. Air Force's tactics, techniques, and procedures related to secure network-centric mission operations. I have also served on the Advisory Board for the U.S. Naval Air Systems Command (NavAir) Future Airborne Capability Environment (FACE) and was a co-lead of a task force on "Published Open Interfaces and Standards" for the U.S. Navy's Open Systems Architecture initiative.

9. For over 30 years, I have conducted and supervised many research projects involving a wide range of software-related topics, including patterns, optimization techniques, and empirical analyses of communication protocol stacks, web servers, and object-oriented middleware frameworks for distributed real-time embedded systems and mobile-/web-based

cloud computing applications. I have published 650+ scholarly articles and technical papers, and I am the coauthor/editor of 10+ books or book-length manuscripts on various topics, including software architecture, network programming, object-oriented frameworks, distributed and real-time systems, open-source middleware platforms, and web-/mobile-based cloud computing applications.

10. My work has been cited 43,000+ times across a comprehensive spectrum of high impact publications, and my current h-index score is 88, which reveals the significant impact of my publications on scholarly literature in the field of computer science. I have also supervised the research of more than 40 PhD and Master's graduate students to date. Together with conducting and publishing my own research, I have served on the editorial board of many journals, including publications by IEEE and the ACM, and I have been a guest editor of many special issue journals based on my research expertise.

11. On top of my research experience, I have decades of hands-on programming experience with a variety of different programming languages. I began programming with C in 1985 and have programmed with object-oriented languages since 1986, when I began to program with C++. I have programmed with Java and other related object-oriented languages since the mid-1990s and early 2000s. Starting in 1991, while at the University of California Irvine, I led the development of one of the first C++ object-oriented frameworks for concurrent and networked middleware and applications (ACE). Starting in 1996, I developed one of the first Java objectoriented frameworks for concurrent and networked middleware and applications (Java ACE).

12. Since 1990, I have taught more than 2,500 students in dozens of face-to-face courses on network programming to both undergraduate and graduate students at UC Irvine, Washington University St. Louis, and Vanderbilt University. Since 2013, I have taught mobile cloud computing to more than 400,000 students in online courses, including Massive Open Online Courses (MOOCs) on the Coursera platform, which have focused on technologies like mobile app programming with Android, Java, and JavaScript, as well as programming cloud computing platforms using various web services frameworks, such as Spring and Node.js.

13. Together with my regular course offerings, over the past 30 years I have also taught 600+ short-courses and tutorials on many subjects, including: software design patterns, object-oriented and functional programming; systems programming and network programming for UNIX and Windows; multi-threading and synchronization; concurrent and parallel programming; and various courses on distributed systems, real-time and embedded systems, TCP/IP, web apps and services, compiler construction, algorithms, and data structures.

14. Attached as Exhibit 1 are excerpts of my rebuttal expert report in this case, served on January 13, 2023. These excerpts are—in relevant part—my expert opinions, and I will testify to these opinions under oath at trial.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge. Executed this 6th day of February, 2023 in Philadelphia, PA.

Douglas C. Schmidt